CALIFORNIA
OCCUPATIONAL GUIDES

Employment Development Department
State of California

AIRCRAFT MECHANICS

CALIFORNIA OCCUPATIONAL GUIDE - **NUMBER 339**
2002

INTEREST AREA
MECHANICAL - REPAIR, MAINTENANCE, AND RELATED

WHAT DOES AN AIRCRAFT MECHANIC DO?

AIRCRAFT MECHANICS have the important responsibility of keeping planes operating safely and efficiently. They service, repair, overhaul, and test aircraft. This guide covers two mechanical specialties: Airframe and Power Plant ("A&P") Mechanics and Aircraft Body Repairers.

Airframe and Power Plant or "A&P" Mechanics

Airframe and Power Plant (A&P) Mechanics work on various parts of the aircraft. The airframe includes the wings, fuselage, brakes, tail assembly, and the oil and fuel tanks. The power plant is the engine and propellers (if used) of the aircraft. Some of the important tasks they may perform include the following:

- Adjust, align, and calibrate aircraft systems using hand tools, gauges, and test equipment.
- Examine and inspect engines or other components for cracks, breaks, or leaks.
- Test engine and system operations using test equipment.
- Listen to engines to detect and diagnose malfunctions.
- Use tools such as ignition analyzers, compression checkers, distributor timers, and ammeters.
- Take apart and inspect parts for wear, warping, or other defects.
- Maintain aircraft systems by flushing crankcases, cleaning screens, greasing moving parts, and checking brakes.
- Assemble and install electrical, plumbing, mechanical, hydraulic, structural, parts, and accessories.
- Use hand tools and power tools.
- Remove or install engine using hoist or forklift truck.
- Read, understand, and work from aircraft maintenance manuals and specifications.
- Modify air or spacecraft systems, or components.
- Ride aircraft and make necessary in-flight adjustments and corrections.

Aircraft Body Repairers

Aircraft Body Repairers, also known as Aircraft Body and Bonded Structure Repairers, perform the following tasks:

- Reinstall repaired or replacement parts using riveting or welding tools, clamps, and wrenches.
- Repair, replace, and rebuild aircraft structures and sections, such as wings, fuselage, rigging, and hydraulic units.
- Repair or fabricate aircraft sections or parts, using metal fabricating machines, saws, brakes, shears, and grinders.

- Trim and shape replacement section to specified size and fit.
- Secure section in place using adhesives, hand tools, and power tools.
- Read work orders, blueprints, and specifications.
- Examine sample or damaged part or structure to determine repair or fabrication procedures and steps of operations.
- Locate and mark dimension and reference lines on defective or replacement part using templates, scribes, compass, and steel rule.
- Remove or cut out defective part or drill holes to gain access to internal defect or damage, using drill and punch.
- Communicate with other workers to fit and align heavy parts or discuss processing of repair parts.
- Clean, strip, prime, and sand structural surfaces and materials prior to bonding.
- Cure bonded structure, using portable or stationary curing equipment.
- Spread plastic film over area to be repaired to prevent damage to surrounding area.

Aircraft Mechanics who work on private planes or for charter airlines usually perform a variety of duties and have more responsibility than Mechanics employed by scheduled airlines. The latter most often have specialized work assignments, which tend to be more routine.

Mechanics who have become inspectors are included in the occupation. They inspect aircraft and systems repairs, making sure that work is done according to standards. They also certify craft airworthiness.

WHAT SKILLS ARE IMPORTANT?

Important skills, knowledge, and abilities for Aircraft Mechanics include:

- Installation – Correctly installing equipment, machines, wiring, or programs.
- Equipment Selection – Determining the kind of tools and equipment needed to do a job.
- Repairing – Repairing machines or systems using the needed tools.
- Problem Identification – Identifying the nature of problems.
- Troubleshooting – Determining what is causing an operating error and deciding what to do about it.
- Equipment Maintenance – Performing routine maintenance and determining when and what kind of maintenance is needed.
- Product Inspection – Inspecting and evaluating the quality of products.
- Testing – Conducting tests to decide whether equipment, software, or procedures are working as expected.
- Mathematics – Using math to solve problems.
- Manual Dexterity – The ability to quickly make coordinated movements of one hand, a hand together with its arm, or two hands to grasp, move, or assemble objects.
- Arm-Hand Steadiness – The ability to keep the hand and arm steady while making an arm movement or while holding the arm and hand in one position.

WHAT'S THE WORK ENVIRONMENT?

Some Mechanics work out on the airfield on "flight lines" where aircraft park in order to make emergency repairs. Conditions can be hot or cold, depending on the weather. Others work inside hangars and in repair shops that afford good lighting, heat, and air conditioning. A major discomfort of the job is caused by the noise from power tools and from aircraft in the process of testing, taking off, and landing. Minor scratches and skinned knuckles from tool slippage are the most frequent injuries in this work. Burns from welding equipment and hot engine surfaces, and falls from ladders or scaffolds are less common.

Flight line jobs at airports can be physically demanding. Work often requires climbing on ladders or scaffolds, crawling under wings, or fitting into tight spaces. Lifting parts and materials up to 50 pounds is sometimes required. Work must often be performed under time pressure to maintain airline flight schedules. At the same time, Aircraft Mechanics cannot sacrifice high work standards to speed up the job.

Aircraft Mechanics are required to have their own hand tools. The tools can be expensive, but schools may loan them to students, and some employers have payment plans for beginning Mechanics to purchase tools. Some shops supply uniforms; in other shops, Mechanics must pay for their uniforms.

Union Membership

Aircraft Mechanics who work for commercial airlines and aerospace firms sometimes belong to the International Association of Machinists and Aerospace Workers, the Transport Workers Union of America, or Teamsters. About one-half of all Aircraft Mechanics are union members.

WHAT'S THE CALIFORNIA JOB OUTLOOK?

The following information is from the occupational projections produced by the Employment Development Department's Labor Market Information Division:

Estimated number of workers in 1998:	14,800
Estimated number of workers in 2008:	17,800
Projected Growth 1998-2008:	20.3%
Est. openings due to separations by 2008:	3,300

These figures do not include self-employment.

The number of Aircraft Mechanics in California is expected to grow about as fast as average compared with all occupations between the years 1998 and 2008. The total number of job openings in the ten-year period amounts to 6,300. This number takes into account replacement needs as people leave for other types of work or retirement.

The overall outlook for Aircraft Mechanics should be favorable over the next ten years. The small numbers of young workers in the labor force, coupled with a large number of retirements, point to good employment conditions for students just beginning training.

Job opportunities are likely to be the best at small commuter and regional airlines, Federal Aviation Administration (FAA) repair stations, and in general aviation. Because wages in these companies tend to be relatively low, there are fewer applicants for these jobs than for jobs with major airlines. Also, some jobs will become available as experienced Mechanics leave for higher paying jobs with airlines, retire, or transfer to another occupation.

Mechanics will face competition for large airline jobs, because the high wages and travel benefits for these jobs attract more qualified applicants than there are openings. Prospects will be best for applicants with significant experience.

Trends

Aircraft now feature a greater number of automated systems that speed repairs and parts replacement. This may have a negative impact on the number of Aircraft Mechanics needed.

WHAT DOES THE JOB PAY?

Wages vary depending on experience, licenses held, size and type of the company, geographic area, and shift worked. Aircraft Mechanics working in the manufacturing sector earn about 15 percent more than those employed in air transportation. Corporate and regional airlines pay about two-thirds as much as the major airlines.

California Earnings

Aircraft Mechanics 2001 Wages

Hourly wages range from	$15.94	to	$24.13
Average hourly wage	$19.85		
Average annual wage	$41,293		

Source: Occupational Employment Survey of Employers by EDD/LMID.

Hours

The normal workweek for Aircraft Mechanics is 40 hours, with occasional overtime for scheduled airlines during the peak summer season.

Benefits

Airlines and independent aircraft repair companies generally offer holidays and vacation time, health and life insurance plans, sick leave, profit sharing, and retirement pensions. Airlines also extend flight benefits in the form of free or reduced air transportation to employees and their families.

HOW DO I PREPARE FOR THE JOB?

Education and Training

Most airlines and general aviation firms require an A&P certificate from the FAA. Aircraft Mechanics

who are not certified must work under the supervision of a certified mechanic who can sign approval of the work before the aircraft or its equipment is considered airworthy.

Applicants for various certificates must meet knowledge, skill, and experience requirements for repairing, servicing, and inspecting specific parts of the aircraft. Aircraft Mechanics usually learn the work by attending a school certified by the FAA for 14 to 24 months. A Mechanic with an airframe, power plant or A&P rating can work only on the specific parts of the aircraft for which he or she is rated.

To be eligible for the FAA certificate examinations, a candidate must have 18 months experience in either airframe or power plant work, or a combination of 30 months in both. Related military service may be used to meet certification requirements. Courses in math, physics, chemistry, electronics, computer science, and mechanical drawing are helpful for students wanting to enter the field. A list of aviation maintenance technician schools that offer certificate programs and other useful references may be obtained from the U.S. Government Printing Office. A list of requirements for Aircraft Mechanics is available on-line at the FAA Web site at www.faa.gov under the "How Do I…?" section.

The listing of aviation mechanic schools may be obtained on the FAA Web site at http://av-info.faa.gov/OSHKOSH/MaintenanceSchool.asp.

Continuing Education

Most employers require Mechanics to take on-going training to update their skills. Mechanics who keep abreast of technological advances in electronics, composite materials, and other areas will be in greatest demand.

HOW DO I FIND THE JOB?

Aircraft Mechanics usually contact employers directly either in person or by resume. Firms which hire in this occupation include commercial airlines, aircraft and parts manufacturers, aircraft service and maintenance companies, and large businesses with their own fleets of planes. Some Aircraft Mechanics work for the federal government as non-military workers at large military bases. Private firms are listed in the yellow pages under Airlines and Aircraft Servicing and Maintenance. California job openings can be found at various online job-listing systems including CalJOBS℠ at www.caljobs.ca.gov or at America's Job Bank at www.ajb.dni.us.

For other occupational and wage information and a listing of the largest employers in any county, visit the Employment Development Department Labor Market Information Web page at www.calmis.ca.gov. Find further job search assistance from your nearest Job Service office www.edd.ca.gov/jsloc.htm or the closest One-Stop site listed on the California WorkNet site, www.sjtcc.ca.gov/sjtccweb/one-stop.

WHERE CAN THIS JOB LEAD?

As Aircraft Mechanics gain experience, they can advance to lead mechanic, crew chief, inspector, or shop supervisor. In the airlines, where promotion is often determined by examination, supervisors may advance to executive positions. Some transfer to larger airlines.

OTHER SOURCES OF INFORMATION

Federal Aviation Administration
800 Independence Ave, SW, Room 810
Washington, DC 20591
(202) 366-4000
www.faa.gov

Professional Aviation Maintenance Association
Ronald Reagan Washington National Airport
Washington, DC 20001
(703) 417-8800
www.pama.org

International Association of Machinists and Aerospace Workers
9000 Machinists Place
Upper Marlboro, MD 20772-2687
(301) 967-4500
www.iamaw.org

Employment Projections by Occupation
www.calmis.ca.gov/htmlfile/subject/occproj.htm

Employment and Wages by Occupation
www.calmis.ca.gov/file/occup$/OES$.htm

RELATED OCCUPATIONAL GUIDES

Automobile Mechanics	No. 24
Bus and Truck Mechanics and Diesel Engine Specialists	No. 251

OCCUPATIONAL CODE REFERENCES

SOC *(Standard Occupational Classification)*

Aircraft Mechanics and Service Technicians	49-3011

O*NET *(Occupational Information Network)*

Aircraft Mechanics and Service Technicians	49-3011.00
Aircraft Body and Bonded Structure Repairers	49-3011.03

OES (*Occupational Employment Statistics*)

Aircraft Mechanics	85323

DOT (*Dictionary of Occupational Titles*)

Airframe and Power-Plant Mechanic	621.281-014